

A
Confutation of Atheism

From the
Structure and Origin of Humane Bodies.

PART II.

A
S E R M O N

Preached at
St Mary-le-Bow,

June 6. 1692.

Being the *Fourth* of the Lecture Founded by
 the Honourable ROBERT BOYLE, Esquire.

By RICHARD BENTLEY, M. A.
 Chaplain to the Right Reverend Father in God,
 EDWARD, Lord Bishop of Worcester.

L O N D O N,

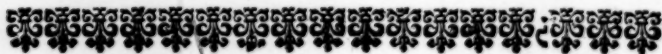
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*Ra. Barker, R^{mo} in Christo Patri
ac D^{no} D^{no} Johanni Archiep. Can-
tuar. à Sacris Domest.*

*June 10.
1692.*



ACTS XVII. 27.

That they shou'd seek the Lord, if haply they might feel after him, and find him : though he be not far from every one of us ; for in him we Live, and Move, and have our Being.

IN the former part of this Enquiry I have examin'd and refuted two Atheistical Notions opposed to the grand Doctrine of the Text, *That we owe our Living and Being to the power of God* : The one of the *Aristotelian* Atheists, who, to avoid the difficulties of the first production of Mankind, without the intervention of Almighty Wisdom and Power, will have the Race to have thus continued without beginning by an eternal succession of infinite past Generations ; which Assertion hath been detected to be mere nonsense, and contradictory to it self : The other of the Astrological undertakers, that would raise Men like Vegetables out of some fat and slimy soil well digested by the kindly heat of the Sun, and impregnated with the influence of the Stars upon some remarkable and periodical conjunctions : Which opinion hath been vamp'd up of late by *Cardan*

and *Cesalpinus*, and other News-mongers from the Skies; a Pretence as groundless and silly, as the dreaming Oneirocriticks of *Artemidorus* and *Astrampsychus*, or the modern Chiromancy and Divinations of Gypsies.

I proceed now to the two remaining Paradoxes of such Sects of Atheists, as laying aside Astrology and the unintelligible Influence of Heavenly Bodies more than by their Gravity, and Heat, and Light, do either produce Mankind mechanically and necessarily from certain connexions of Natural Causes, or more dully and supinely, though altogether as reasonably, resolve the whole Business into the unaccountable shuffles and tumults of Matter, which they call Chance and Accident. But at present I shall only take an account of the supposed Production of Humane Bodies by Mechanism and Necessity.

The Mechanical or Corpuscular Philosophy, though peradventure the oldest, as well as the best in the world, had lain buried for many Ages in contempt and oblivion; till it was happily restored and cultivated anew by some excellent Wits of the present. But it principally owes its re-establishment and lustre, to that Honourable Person of ever Blessed Memory, who hath

hath not only shewn its usefulness in Physiology above the vulgar Doctrines of Real Qualities and Substantial Forms; but likewise its great serviceableness to Religion it self. And I think it hath been competently proved in a former Discourse, how friendly it is to the Immateriality of Humane Souls, and consequently to the Existence of a Supreme Spiritual Being. And I may have occasion hereafter to shew further, that all the Powers of Mechanism are intirely dependent on the Deity, and do afford a solid Argument for the Reality of his Nature. So far am I from the apprehension of any great feats, that this Mechanical Atheist can do against Religion. For if we consider the Phenomena of that Material World with a due and serious attention, we shall plainly perceive, that its present frame and constitution and the established Laws of Nature are constituted and preserved by Gravitation alone. That is the powerfull cement, which holds together this magnificent structure of the world; *Which stretcheth* Job 26. 7. *the North over the empty space, and hangeth the Earth upon Nothing*; if we may transfer the words of Job from the first and real Cause to the secondary Agent. Without that the whole Universe, if we suppose an undetermin'd power of Motion

Motion infused into Matter, would have been a confused Chaos, without beauty or order, and never stable and permanent in any condition. Now it may be proved in its due place, that this Gravity, the great Basis of all Mechanism, is not it self Mechanical; but the immediate *Fiat* and Finger of God, and the Execution of the Divine Law; and that Bodies have not the power of tending towards a Centre, either from other Bodies or from themselves: which at once, if it be proved, will undermine and ruine all the Towers and Batteries that the Atheists have raised against Heaven. For if no Compound Body in the visible world can subsist and continue without Gravity, and Gravity do immediately flow from a Divine Power and Energy; it will avail them nothing, though they should be able to explain all the particular Effects, even the Origination of Animals, by mechanical principles. But however at present I will forbear to urge this against the Atheist. For, though I should allow him, that this Catholick Principle of Gravitation is essential to Matter without introducing a God; yet I will defy him to shew, how a Humane Body could be at first produced naturally, according to the present System of things, and the mechanical affections of Matter.

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And because this Atheist professeth to believe as much as we; that the first production of Mankind was in a quite different manner from the present and ordinary method of Nature, and yet affirms nevertheless, that That was Natural too; which seems at the first sight to be little less than a contradiction: It should lie upon him to make out, how matter by undirected Motion could at first necessarily fall, without ever Erring or Miscarrying, into such a curious formation of Humane Bodies; a thing that by his own confession it was never able to do since, or at least hath not done for some thousands of years: to declare to us what shape and contexture Matter then had, which it cannot have now: how it came to be altered by long course of time, so that living Men can no more be produced out of putrefaction in the primary way; and yet the species of Mankind, that now consists of and is nourished by Matter so altered, should continue to be the same as it was from the beginning. He should undertake to explain to us the first steps and the whole progress of such a formation; at least by way of *Hypothesis*, how it naturally might have been, though he did not affirm that it was actually so. Whether he hath a new Notion

tion peculiar to himself about that Production, or takes up with some old one, that is ready at hand: whether that most witty Conceit of *Anaximander*, That the first Men and all

Plutarch.
de Plac.
Phi. lib. 5.
c. 19. &
Symposi. 8.
c. 3. Censorinus
de die Natali
cap. 4.

Animals were bred in some warm moisture, inclosed in crustaceous skins, as it were various kinds of Crabfish and Lobsters; and so they continued, till they had arrived at perfect age; when their shelly Prisons growing dry and breaking made way for their liberty: or the no less ingenious opinion of the great *Empedocles*;

Plutarch.
de Plac.
Phil. 5. 19.
Censorin.
ibidem.

That Mother Earth first brought forth vast numbers of Legs, and Arms, and Heads, and the other members of the Body scatter'd and distinct, and all at their full growth; which coming together and cementing (as the pieces of Snakes and Lizards have been said to do, if one cuts them asunder) and so configuring themselves into Humane shape, made lusty proper men of thirty years age in an instant: or rather the divine Doctrine of *Epicurus* and the *Aegyptians*;

Censorinus, ibid.
Lucret.
lib. 5.
Diodorus
Siculus,
lib. 1. c. 2.

That there first grew up a sort of Wombs, that had their Roots in the Earth, and attracted thence a kind of Milk for the nourishment of the inclosed *Fetus*; which at the time of maturity broke through those Membranes, and shifted for themselves. I say, he ought

ought to acquaint us which of these he is for, or bring a new explication of his own; and not require *Us* to prove the Negative, That a Spontaneous production of Mankind, neither warranted by example, nor defended by reason, nevertheless may not *possibly* have been true. This is a very unreasonable demand, and we might justly put him off with such an answer as this; That there are several things, which all men in their wits do disbelieve, and yet none but madmen will go about to disprove. But to shew him how much we endeavour to satisfy and oblige him, I will venture once for his sake to incur the censure of some persons for being elaborately trifling. For with respect to the most of Mankind, such wretched absurdities are more wisely contemn'd than confuted, and to give them a serious answer, may only make them look more considerable.

First then, I take it for granted by him, That there were the same Laws of Motion, and the like general Fabrick of the Earth, Sea and Atmosphere, at the beginning of Mankind, as there are at this day. For if any Laws at first were once settled and constituted; like those of the *Medes* and *Persians*, they are never to be reversed. To violate and infringe them, is the same

Plutarch.
de Plac.
Phi. lib. 5.
c. 19. §
Sympos. 8.
c. 8. Censorinus de
die Natali
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Plutarch.
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Phi. 5. 19.
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ibidem.

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Lucret.
lib. 5.
Diodorus
Siculus,
lib. 1. c. 2.

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as what we call Miracle; and doth not sound very Philosophically out of the mouth of an Atheist. He must allow therefore, that Bodies were endowed with the same affections and tendencies then as ever since, and that if an *Ax-head* be supposed to float upon water, which is specifically much lighter than it; it had been supernatural at that time, as well as in the days of *Elisha*. And this is all that I desire him to acknowledge at present. So that he may admit of those Arguments as valid and conclusive against his *Hypothesis*, that are fairly drawn from the present powers of Matter, and the visible constitution of the World.

Now that we may come to the point; All Matter is either Fluid or Solid, in a large acceptation of the words, that they may comprehend even all the middle degrees between extreme Fixedness and Coherency, and the most rapid intestine motion of the Particles of Bodies. Now the most cavilling Atheist must allow, that a solid inanimate Body, while it remains in that state, where there is none, or a very small and inconsiderable change of Texture, is wholly incapable of a vital production. So that the first Humane Body, without Parents and without a Creator, if such an one ever was, must have

have naturally been produced in and constituted by a Fluid. And because this Atheist goes mechanically to work ; the universal Laws of Fluids must have been rigidly observed during the whole process of the Formation. Now this is a Catholick Rule of Staticks ; That if any Body be bulk for bulk heavier than a Fluid, it will sink to the bottom of that Fluid ; and if lighter, it will float upon it ; having part of it self extant, and part immersed to such a determinate depth, as that so much of the Fluid as is equal in Bulk to the immersed part, be equal in Gravity to the whole. And consequently if several portions of one and the same Fluid have a different specifick gravity, the heavier will always (in a free vessel) be gradually the lower ; unless violently shaken and blended together by external concussion. But that cannot be in our present case. For I am unwilling to affront this Atheist so much, as to suppose him to believe, that the first organical Body might possibly be effected in some Fluid portion of Matter, while its Heterogeneous parts were jumbled and confounded together by a Storm, or Hurricane, or Earthquake. To be sure he will rather have the primitive Man to be produced by a long process in a kind of digesting *Balneum*, where all the heavier Lees

Archimedes de In-
sidentibus
humido,
lib. 1.
Stevin des
Elements
Hydrosta-
tiques.

may have time to subside, and a due *Æquilibrium* be maintain'd, not disturb'd by any such rude and violent shogs, that would ruffle and break all the little *Stamina* of the *Embryon*, if it were a making before. Now because all the parts of an undisturbed Fluid are either of equal Gravity, or gradually placed and storied according to the differences of it; any concretion that can be supposed to be naturally and mechanically made in such a Fluid, must have a like structure of its several parts; that is, either be all over of a similar Gravity, or have the more ponderous parts nearer to its Basis. But there need no more concessions than this, to extinguish these supposed First-born of Nature in their very formation. For suppose a Humane Body to be a forming in such a Fluid in any imaginable posture, it will never be reconcilable to this Hydrostatical Law. There will be always something lighter beneath, and something heavier above; because Bone, or what is then the Stuff and Rudiments of Bone, the heaviest *in specie*, will be ever in the midst. Now what can make the heavier particles of Bone ascend above the lighter ones of Flesh, or depress these below those, against the tendency of their own Nature? This would be wholly as miraculous, as the swimming

ming of Iron in Water at the command of *Elisha*: and as impossible to be, as that the Lead of an Edifice should naturally and spontaneously mount up to the Roof, while lighter materials employ themselves beneath it: or that a Statue, like that in *Nebuchadnezzar's* Vision, whose Head was of fine and most ponderous Gold, and his Feet of Iron and Clay, should mechanically erect it self upon them for its Basis.

Secondly, Because this Atheist goes mechanically to work, he will not offer to affirm, That all the parts of the *Embryon* could according to his explication be formed at a time. This would be a supernatural thing, and an effectual refutation of his own Principles. For the Corpuscles of Matter having no consciousness of one anothers acting (at least before or during the Formation; as will be allowed by that very Atheist, that attributes Reason and Perception to them, when the Formation is finished) they could not consent and make a compact together, to carry on the work in several places at once; and one party of them be forming the Brain, while another is modelling the Heart, and a third delineating the Veins. No, there must be, according to Mechanism, a successive and gradual operation: Some few Particles must

must first be united together, and so by apposition and mutual connexion still more and more by degrees, till the whole System be completed: and a Fermentation must be excited in some assignable place, which may expand it self by its Elastical power; and break through, where it meets with the weakest resistance; and so by that so simple and mechanical action, may excavate all the various Ducts and Ventricles of the Body. This is the only general account, as mean as it appears to be, that this Machin of an Atheist can give of that *fearfull and wonderfull* Production. Now to confute these Pretences, *First*, There is that visible Harmony and Symmetry in a Humane Body, such a mutual communication of every vessel and member of it, as gives an intrinsick evidence; that it was not formed successively, and patch'd up by piecemeal. So uniform and orderly a system with innumerable Motions and Functions, all so placed and constituted, as never to interfere and clash one with another, and disturb the Oeconomy of the whole, must needs be ascribed to an Intelligent Artist; and to such an Artist, as did not begin the matter unprepared and at a venture; and when he was put to a *Nonplus*, pause and hesitate, which way he should proceed;

ceed; but he had first in his comprehensive Intellect a complete *Idea* and Model of the whole Organical Body, before he enter'd upon the Work. But *Secondly*; if they affirm; That mere Matter by its mechanical Affections without any design or direction could form the Body by steps and degrees; what member then do they pitch upon for the foundation, and cause of all the rest? Let them shew us the beginning of this Circle; and the first Wheel of this Perpetual Motion. Did the Blood first exist, antecedent to the formation of the Heart? But that is to set the Effect before the Cause: because all the Blood that we know of, is made in and by the Heart, having the quite different form and qualities of Chyle, before it comes thither. Must the Heart then have been formed and constituted, before the Blood was in being? But here again, the Substance of the Heart it self is most certainly made and nourished by the Blood, which is conveyed to it by the Coronary Arteries. And thus it is through the whole system of the Body; every member doth mutually sustain and supply one another; and all are coætantaneous, because none of them can subsist alone. But they will say, That a little Ferment first making a Cavity, which became the left Ventricle of the Heart, did thence further expand it self,
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Cartesius
de Formatione Fetus.

and thereby delineate all the Arteries of the Body. Now if such a slight and sorry business as that, could produce an Organical Body; one might reasonably expect, that now and then a dead lump of Dough might be leaven'd into an Animal: for there a like Ferment makes notable Tumors and Ventricles; besides sundry long and small Channells, which may pass tolerably well for Arteries and Veins. But I pray, in this supposed Mechanical Formation, when the Ferment was expanded to the extremities of the Arteries, if it still had any elastical force remaining, why did it not go on and break through the Receptacle, as other Ferment must be allowed to have done at the Mouth and the Nostrils? There was as yet no membranous Skin formed, that might stop and repell it. Or if the force of it was spent, and did not wheel about and return; what mechanical cause then shall we assign for the Veins? for this Ferment is there supposed to have proceeded from the small capillary extremities of them to the Great Vein and the Heart; otherwise it had made Valves which would have stopp'd its own passage. And why did that Ferment, that at first dispersed it self from the Great Artery into infinite little ramifications, take a quite contrary method in the making of the Veins, where innumerable
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little Rivulets have their confluence into the Great Vein, the common chanel of the Blood? Are such opposite motions both equally mechanical, when in both cases the Matter was under the same modification? And *again*, When the first Ferment is excited, and forms the left Ventricle; if the Fluid Matter be uniform and of a similar texture, and therefore on all sides equally resist the Expansion; then the Cavity must continue One, dilated more and more, 'till the expansive force and the uniform resistance be reduced to an equality, and so nothing at all can be formed by this Ferment, but a single round Bubble. And moreover this Bubble (if that could make a Heart) by reason of its comparative Levity to the Fluid that incloses it, would necessarily ascend to the top; and consequently we should never find the Heart in the midst of the Breast. But if the Fluid be supposed to consist of Heterogeneous Particles, then we cannot conceive how those dissimilar parts should have a like situation in two several Fluids, when the Ferment begins. So that upon this supposition there could be no Species of Animals, nor any Similitude between them: One would have its Lungs, where another hath its Liver, and all the other Members præposterously placed;

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there could not be a like Configuration of Parts in any two Individuals. And again, What is that which determines the Growth of all living Creatures? What principles of Mechanism are sufficient to explain it? Why do not all Animals continually increase in bigness during the whole space of their Lives, as it is reported of the Crocodile? What sets a bound to their stature and dimensions? and if we suppose a Bound and *Ne plus ultra* to be mechanically fixed, why again so great a variety in the Bulk of the several Kinds? why also such Constancy observed in that manifold Variety? For as some of the largest Trees have Seeds no bigger or less than some diminutive Plants, and yet every Seed is a perfect Plant with Trunk and Branches and Leaves inclosed in a Shell: So the first *Embryon* of an Ant is supposed by inquisitive Naturalists to be as big, as that of an Elephant, and to promise as fair at its primitive Formation for as spacious a Body: which nevertheless by an immutable Decree can never arrive to the millionth part of the others Bulk. And what modification of the first liquid Matter can vary so much, as to make one Embryon capable of so prodigiously vast augmentation, while another is confined to the minuteness of an Insect? Is not this manifestly a Divine Sanction, that

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Hist. In-
sect. p. 3.

that hath fixed and determin'd the Shape, the Stature, the Appetites, and the Duration of all Creatures in the World? Hither must we have recourse in that great and mysterious Affair of an Organical Formation : And I profess that I cannot discern one step in the whole, that is agreeable to the natural Laws of Motion. If we consider the Heart, which is supposed to be the first principle of Motion and Life, and mentally divide it into its constituent Parts, its Arteries and Veins and Nerves and Tendons and Membranes, and the innumerable little Fibres, that these Secondary Parts do consist of ; we shall find nothing here Singular, but what is in any other Muscle of the Body. 'Tis only the Site and Posture of these several Parts and the Configuration of the whole, that give it the Form and Functions of a Heart. Now why should the first single Fibres in the Formation of the Heart be peculiarly drawn in Spiral Lines; when the Fibres of all other Muscles are made by a transverse rectilinear Motion? What could determin the Fluid Matter into that odd and singular Figure, when as yet no other Member is supposed to be form'd, that might design the Orbit of its Course? Let Mechanism here make an Experiment of its Power, and produce a spiral and turbinated motion of the whole

moved Body without an external Director. When all the Organs are once framed by a supernatural and divine Principle, we do willingly admit of Mechanism in many Functions of the Body: but that the Organs themselves should be mechanically formed, we conceive it to be impossible and utterly inexplicable. And if any Atheist will give a clear and philosophical account of the things that are here touch'd upon; he may then hear of many more and perhaps more difficult than these, which their unsuitness for a popular Auditory, and the remaining Parts of my Subject, that press forward to be treated of, oblige me now to omit.

But as the Atheist, when he is put to it to explain, How any Motion of dead Matter can beget Thought and Perception, will endeavour to defend his baffled Impiety with the instance of Brutes, which he calls Thinking Machines: so will he now also appeal from the Arbitration of Reason in the Case of Animal Productions, to Example and Matter of Fact. He will declame to us about the admirable Structure of the Bodies of Insects; that they have all the Vital Parts, which the largest of Quadrupeds and even Man himself can boast of; whose Fabrick they the rather excell in his opinion, for that

that very Minuteness, that makes them contemptible: and that one would be apt to imagine, that these elegant and elaborate little Engines were all now propagated by Generation, and at first produced by some Divine Wisdom and Power; if we did not find by experience, that they are the easie and obvious Products of unintelligent Nature, that spontaneously and mechanically forms them out of putrefied Carcasses and the warm moisture of the Soil: and yet (which is mightily to his purpose) that these Insects, so begotten without Parents, have nevertheless fit Organs of Generation and Difference of Sex, and can propagate their own kinds, as if themselves had been born so too: and that if Mother Earth in this her barrenness and decrepitness of Age can procreate such swarms of curious Engines, which not only themselves enjoy their portion of Life, but by a most wonderful Instinct impart it to many more, and continue their Species: might she not in the flower of her Youth, while she was succulent and fertile, have produced Horses and Elephants and even Mankind it self, the largest and perfectest Animals, as easily as in this parched and sterile condition she can make a Frog or an Insect? Thus he thinks, he hath made out from Example and Analogy, that at the Beginning
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of things every Species of Animals might spring mechanically out of the Soil without an Intelligent Creator. And indeed there is no one thing in the World, which hath given so much Countenance and Shadow of Possibility to the Notion of Atheism, as this unfortunate mistake about the æquivocal generation of Insects: And as the oldest Remains of Atheistical Writings are charged full with that Comparison; so it is the main refuge of those, that in this and the last Age have had the Folly and Impudence to appear in so wretched a Cause.

Now to this last Subterfuge of the Mechanical Atheists we can occur several ways. And at present we affirm, *First, ex abundanti*, That though we should allow them the spontaneous production of some minute Animals, yet a like primitive Origination of Mankind could not thence be concluded. Because they first tacitly suppose, that there is an universal decay of Moisture and Fertility in the Earth. And they cannot avoid the necessity of so doing: For if the Soil be as fruitfull now, as it was in the beginning; why would it not produce Men, and the nobler kinds of Beasts in our days too, if ever it did so? So that if that supposition be evinced to be erroneous and groundless, all the Arguments that they build upon it, will be sub-

subverted at once. Now what more easily refuted, than that old vulgar Assertion of an universal Drought and Exsiccation of the Earth? As if the Sun could evaporate the least drop of its Moisture, so that it should never descend again, but be attracted and elevated quite out of the Atmosphere? 'Tis now a matter agreed and allowed by all competent Judges, that every Particle of Matter is endowed with a Principle of Gravity, whereby it would descend to the Centre, if it were not repelled upwards by heavier bodies. So that the smallest Corpuscle of Vapour, if we suppose it to be exhaled to the top of the Atmosphere, thence it must come down again, or at least must there remain incumbent upon others: for there's either nothing or nothing heavier above it to protrude it any higher, neither can it spontaneously mount any more against the tendency of its nature. And lest some ignorant Atheist should suspect, that peradventure there may be no such Top of the Atmosphere; but that it may be continued on to the Sun or to indefinite Space: he must vouchsafe to be instructed, That the whole weight of any Column of the Atmosphere, and likewise the Specifick gravity of its Basis are certainly known by many Experiments; and that by this computation (even making allowance

ance for its gradually larger Expansion, the higher we go,) the very top of any Pillar of Air is not One hundred Miles distant from the Surface of the Earth. So that hence it is manifest, that the whole Terraqueous Globe with its Atmosphere cannot naturally have lost the least particle of Moisture, since the foundation of the World. But still they may insist, That although the whole Globe cannot be deprived of any of its Moisture, yet the habitable Earth may have been perpetually the drier, seeing it is assiduously drained and exhausted by the Seas. But to this we reply, That the very contrary is demonstrable; That the longer the World shall continue, the Moisture will be the whole Aggregate of the Land. For (to take no notice of the supply of its moisture by Rains and Snow and Dews and Condensation of Vapours, and perhaps by subterraneous passages) the tops of Mountains and Hills will be continually washed down by the Rains, and the Channels of Rivers corroded by the Streams; and the Mud that is thereby conveyed into the Sea will raise its bottom the higher; and consequently the Declivity of Rivers will be so much the less; and therefore the Continents will be the less drain'd, and will gradually increase in Humidity from the first period of their Duration

tion to their final Consummation of all things: if a Divine Power do not interpose and change the settled course and order of Nature.

But let us allow their supposition, That the Total of the dry Land may have been robbed of some of its Moisture which it had at its first Constitution: yet still there are some parts of the Earth sufficiently soak'd and water'd, to produce, if ever, those Sensitive and Locomotive and Intelligent Plants. For do not the *Nile*, and the *Niger*, and the *Ganges*, and the *Menam*, make yearly Inundations in our days, as they have formerly done? And are not the Countries so overflown still situate between the Tropicks under the direct and most vigorous Rays of the Sun, the very place where these Mechanical Atheists lay the Scene of that great Transaction? So that if Mankind had ever sprung naturally out of the Soil, the Experiment would succeed now every year in *Æthiopia* and *Siam*; where are all the requisite qualifications, that ever have been, for such a production. And *again*, if there hath been such a gradual diminution of the Generative Faculty of the Earth, that it hath dwindled from nobler Animals to puny Mice and Insects; why was there not the like decay in the production of

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Vegetables? We should have lost by this time the whole Species of Oaks and Cedars and the other tall and lofty Sons of the Forest, and have found nothing but dwarfish Shrubs and creeping Moss and despicable Mushrooms. Or if they deny the present spontaneous production of larger Plants, and confine the Earth to as Pigmic Births in the Vegetable Kingdom, as they do in the other: yet surely in such a supposed universal decay of Nature, even Mankind it self that is now nourished (though not produced) by the Earth, must have degenerated in Stature and Strength in every Generation. And yet we have certain demonstration from *Egyptian* Mummies, and *Roman* Urns and Rings and Measures and *Ædifices* and many other Antiquities, that Human Stature has not diminished for above Two Thousand years. Now if the Decay hath not been constant and gradual, there hath been no Decay at all; or at least no natural one, nor what may be accounted for by this Mechanical Atheist. I conclude therefore, That although we should allow the spontaneous production of Insects; yet no Argument can be deduced from thence for a like Origination of Mankind.

But,

But, *Secondly*, we affirm, That no Insect or Animal did ever proceed æquivocally from Putrefaction, unless in Miraculous Cases, as in *Ægypt* by the Divine Judgments; but all are generated from Parents of their own Kind, Male and Female: a Discovery of that great Importance, that perhaps few Inventions of this Age can pretend to equal Usefulness and Merit; and which alone is sufficient (if the Vices of Men did not captivate their Reason) to explode and exterminate rank Atheism out of the World. For if all Animals be propagated by Generation from Parents of their own Species, and there be no instance in Nature of even a Gnat or a Mite either now or in former Ages spontaneously produced *de novo*: how came there to be such Animals in Being, and whence could they proceed? There is no need of much study and deliberation about it: for either they have existed eternally by infinite Successions already gone and past, which is in its own Notion absurd and impossible; or their Origin must be ascribed to a Supernatural and Divine Power, that formed and created them. Now to prove our assertion about the Seminal production of all living Creatures; that we may not repeat the Reasons which we have offer'd before against

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the first Mechanical Formation of Human Bodies, which are equally valid against the spontaneous Origin of the minutest Insects; we appeal to Observation and Experiment, which carry the strongest conviction with them, and make the most sensible and lasting impressions. For whereas it hath been the general Tradition and Belief, that Maggots and Flies breed in putrefied Carcasses, and particularly Bees come from Oxen, and Hornets from Horses, and Scorpions from Crabfish, &c. all is now found to be Fable and Mistake. That sagacious and learned Naturalist *Francisco Redi* made innumerable trials with the putrid Flesh of all sorts of Beasts and Fowls and Fishes and Serpents, with corrupted Cheese and Herbs and Fruits and even Insects themselves: and he constantly found, that all those Kinds of Putrefaction did only afford a Nest and Aliment for the Eggs and Young of those Insects that he admitted to come there; but produced no Animal of themselves by a spontaneous Formation. For when he suffer'd those things to putrefie in Hermetically sealed Glasses, and Vessels close cover'd with Paper; and not only so, lest the Exclusion of the Air might be supposed to hinder the Experiment; but in Vessels cover'd with

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σφῆκες γὰρ
γενεῖται, καὶ
ἐστὶ δὲ μὴ
ἀποβῆναι.
Nicander.

Redi De
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one inse-
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with fine Lawn, so as to admit the Air and keep out the Insects: no living thing was ever produced there, though he exposed them to the action of the Sun, in the warm Climate of *Florence*, and in the kindest season of the year. Even Flies crush'd and corrupted, when inclosed in such Vessels, did never procreate a new Fly: though there, if in any case, one would have expected that success. And when the Vessels were open, and the Insects had free access to the Aliment within them, he diligently observed, that no other Species were produced, but of such as he saw go in and feed and deposit their Eggs there: which they would readily do in all Putrefaction; even in a mucilage of bruised Spiders, where Worms were soon hatch'd out of such Eggs, and quickly changed into Flies of the same kind with their Parents. And was not that a surprizing Transformation indeed, if according to the vulgar opinion those dead and corrupted Spiders spontaneously changed into Flies? And thus far we are obliged to the diligence of *Redi*: from whence we may conclude, That no dead Flesh nor Herbs nor other putrefied Bodies, nor any thing that hath not then actually either a vegetable or animal Life can produce any Insect.

And

And if we should allow, as he did, that every Animal and Plant doth naturally breed and nourish by its substance some peculiar Insect : yet the Atheist could make no advantage of this Concession as to a like Origination of Mankind. For surely 'tis beyond even an Atheist's Credulity and Impudence, to affirm that the first Men might proceed out of the Galls and Tumors of Leaves of Trees, as some Maggots and Flies are supposed to do now ; or might grow upon Trees, as the story goes about Barnacles ; or perhaps might be the Lice of some vast prodigious Animals, whose Species is now extinct. But though we suppose him guilty of such an extravagant folly, he will only shift the difficulty, and not wholly remove it ; for we shall still expect an account of the spontaneous Formation of those mountainous kind of Animals and Men-bearing Trees. And as to the Worms that are bred in the Intestines and other inward parts of Living Creatures, their production is not material to our present enquiry, till some Atheist do affirm, that his own Ancestors had such an Original. I say, if we should allow this concession of *Redi*, it would do no service to our Adversaries: but even here also they are defeated

ted by the happy curiosity of *Malpighi* and others, who observed and discovered, That each of those Tumors and Excreescences of Plants, out of which generally issues a Fly or a Worm, are at first made by such Insects, which wound the tender buds with a long hollow Trunk, and deposit an Egg in the hole with a sharp corroding liquor, which causeth a swelling in the leaf, and so closeth the orifice: and within this Tumor the Worm is hatcht and receives its aliment, till it hath eat its way through. Neither need we recurr to an æquivocal production of Vermin in the *Phthiriasis* and in *Herod's* Disease, who was *σκαλινος*, eaten of *Act. 12. 23.* worms, or maggots. Those horrible distempers are always accompanied with putrefying ulcers; and it hath been observed by the most accurate *Lewenboeck*, that Lice and Flies, which have a most wonderfull instinct and acuteness of sense to find out convenient places for the hatching and nourishment of their young, do mightily endeavour to lay their Eggs upon Sores; and that one will lay above a hundred Eggs, and may naturally increase to some hundreds of thousands in a quarter of a year: which gives a full and satisfactory account of the *Phænomena* of those Diseases. And whereas it

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*Continuat.
Epistol. p.
101.*

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is said, *Exod. 16. v. 20.* That some of the *Israelites left of the Manna until the morning, and it bred worms and stank*; which an Atheist may make an objection, as either against us, or against the truth of the Scriptures: I understand it no otherwise, than that the Manna was *fly-blown*. It was then the Month of *October*, which in that Southern Climate, after the preceding Autumnal Rains, doth afford a favourable season and copious nutriment for infinite swarms of Insects. Neither do I ascribe it to a miraculous power, that some of the Manna should breed worms, but that all the rest should be preserved sound and untainted. And if any one shall rigidly urge the literal expression of *breeding*; he must give leave to speak in the language of the Vulgar in common affairs of life. We do now generally believe the *Copernican System*; yet I suppose upon ordinary occasions we shall still use the popular terms of *Sun-rise* and *Sun-set*, and not introduce a new pedantick description of them from the motion of the Earth. And then as to the vulgar opinion, That *Frogs* are made in the *Clouds* and brought down by the *Rains*, it may be thus easily refuted: for at that very instant, when they are supposed to descend,
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you may find by dissection not only their Stomachs full of meat, but their Intestines full of excrement: so that they had lurked before in the day-time in holes and bushes and grass, and were then invited abroad by the freshness of a Shower. And by this time we may understand, what credit and authority those old Stories ought to have about monstrous productions in *Ægypt* after the inundation of the *Nile*, of Mice and Frogs and Serpents, half flesh and half mud; nay of the Legs, and Arms, and other Limbs of Men, & *quicquid Græcia mendax*; altogether as true, as what is seriously related by *Helmont*, That foul Linen, stopt in a vessel that hath Wheat in it, will in 21 days time turn the Wheat into Mice: which without conjuring one may guess to have been the philosophy and information of some Housewife, who had not so carefully cover'd her wheat, but that the Mice could come at it, and were there taken napping, just when they had made an end of their good cheer. Corn is so innocent from this calumny of breeding of Mice; that it doth not produce the very Weevils that live in it and consume it: the whole course of whose generation and periodical changes hath been curiously observed and described by the ingenious *Lewenhoeck*. And moreover, that we may deprive the Atheist of all hopes and pretensions of Argument from this baffled opinion of æquivocal Insects, we

Helmont
Imago Fer-
ment. Sec.
p. 92. Edit.
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will acquaint him from the most accurate observations of *Swammerdam*, That even the supposed change of Worms into Flies is no real transmutation; but that most of those Members, which at last become visible to the Eye, are existent at the beginning, artificially complicated together, and cover'd with Membranes and Tunicles, which are afterwards stript off and laid aside: and all the rest of that process is no more surprizing, than the eruption of Horns in some Brutes, or of Teeth and Beard in Men at certain periods of age. And as we have establish'd our assertion of the seminal production of all kinds of Animals; so likewise we affirm, That the meanest Plant cannot be rais'd without seed by any formative power residing in the Soil. To which assertion we are encourag'd, *First*, from the known Seeds of all Vegetables, one or two only excepted, that are left to future discovery: which Seeds by the help of Microscopes are all found to be real and perfect Plants, with Leaves and Trunk curiously folded up and enclosed in the *Cortex*: nay one single grain of Wheat or Barly or Rye, shall contain four or five distinct Plants under one common Tunicle: a very convincing argument of the Providence and Goodness of God; that those Vegetables that were appointed to be the chief sustenance of Mankind, should have that multiplied fecundity above any others: and *secondly*, by that famous experiment

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of *Malpighi*, who a long time enclosed a quantity of Earth in a vessel, secured by a fine cloth from the small imperceptible seeds of Plants that are blown about with the winds; and had this success of his curiosity, to be the first happy discoverer of this noble and important Truth, That no species of Plants can be produced out of Earth *de novo*, without a præexistent seed; and consequently they were all created and raised at the beginning of things by the Almighty Gardener, God blessed for ever. And *Lastly*, as to those various and elegant Shells, that are dug up in Continents and embodied in Stones and Rocks at a vast distance from any Sea; which this Atheist may possibly allege for an instance of a Plastick faculty of Nature: tis now generally agreed by the most diligent Inquirers about them, That they are no sportfull productions of the Soil, as was formerly believed, but that all did once belong to real and living Fishes; seeing that each of them doth exactly resemble some other Shell on the Sea-shore, both in its outward lineaments, and inward texture, and specifick gravity, and all other properties: which therefore are so far from being subservient to Atheists in their audacious attempts against God and Religion, that they rather afford an experimental confirmation of the Universal Deluge.

And thus we have competently shewn, that every Species of Living Creatures, every small Insect, and

and even the Herbs of the Field give a casting vote against Atheism; and declare the necessity of a supernatural Formation. If the Earth in its first constitution had been left to its self, what horrid deformity and desolation had for ever overspread its face? not one living Inhabitant found on all its spacious surface; not so much as a Worm in the Bowels of it, nor one single Fish in the vast Bosom of the Sea; not a Mantle of Grass or Moss, to cover and conceal the nakedness of Nature. An eternal Sterility must have possessed the World, where all things had been fixed and fasten'd everlastingly with the Adamantin chains of Specifick Gravity; if the Almighty had not spoken and said, *Let the Earth bring forth Grass, the Herb yielding Seed, and the Fruit-tree yielding Fruit after its kind, and it was so.* 'Twas God, that then created the first seminal forms of all Animals and Vegetables, that commanded the Waters to bring forth abundantly, and the Earth to produce Living Creatures after their kind; that made Man in his own Image after his own likeness: that by the efficacy of his first Blessing made him be fruitfull and multiply and replenish the Earth; by whose alone power & conservation we all live and move and have our Being.

May the same most Glorious God of his infinite mercy grant, that as we have sought the Lord, and felt after him, and found him in these works of his Creation: so now that we have known God, we may glorify him as God both now, and for evermore. Amen.

F I N I S.